

ART. XII.—*The Lichens of Victoria. Part I.*

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INTRODUCTION.

I.—THE STRUCTURE OF LICHENS.

Lichens are cellular plants, and consist generally of *thallus*, *apothecia*, and *spermatogones*.

1. The thallus is usually composed of layers (*a*) *cortical*, (*b*) *gonidial*, (*c*) *medullary*, and (*d*) *hypothalline*.

(*a*) The cortical layer, which occurs on the upper surface of most, and also on the under surface of many lichens, varies in composition, but is generally formed of closely compacted cellules. It varies also in colour, in thickness, in degree of tenacity, and in smoothness of surface. The inferior cortex of many lichens is furnished with *rhizinae*, or root-like filaments, by which the plants are attached to their substratum.

(*b*) The gonidial system, which generally occurs immediately under the cortex, is specially characteristic of this class of plants. When the gonidial cells are completely filled with bluish or olive-green matter, they are called *granula gonima*; but when the yellowish-green contents are surrounded by a hyaline space within the cell, they are called *gonidia*. Both kinds are usually spheroidal. In some genera the gonidia are flat and irregular in outline, *chroolepoid*. Some lichens are *chrysogonimic*, with golden yellow gonidia.

(*c*) The medulla, which is found beneath the gonidial system of many lichens, consists of colourless, tubular, and articulate filaments, more or less closely compacted or interlaced.

(*d*) The hypothallus, which is spread under the thallus of some lichens, is usually of a dark colour, and is formed of the filamentous growth arising from the germinated spores, on which the other parts of the thallus are deposited.

2. The apothecium, or reproductive organ, consists of (1) an *excipulum*, either pale or dark, on which lies (2) the *hypothecium*, also either dark or colourless. From the surface of the latter rises (3) the *thecium* or *hymenium*, which contains *thecæ*, generally surrounded by *paraphyses* or club-shaped filaments, all which are usually glued together by the *gelatina hymenia*. The surface formed by the conglutinated apices of the paraphyses is termed the *epithecium* or disk. The hypothecium of nucleated apothecia is styled a *perithecium*.

The various forms of apothecia are (a) *lecanorine*, *i.e.*, orbicular and bordered by a thallose margin; (b) *lecideine*, *i.e.*, orbicular with no thallose margin, but often bordered by the edge of the excipulum or hypothecium, which is called a *proper* margin, *i.e.*, a margin proper to the apothecium; (c) *graphidine*, *i.e.*, like writing, irregular in form, but typically narrow and horizontally lengthened; and (d) *pyrenodine*, *i.e.*, globular and nucleated.

The thecæ contain spores, usually 8, but sometimes 1, or 2, or 4, or 6, or sometimes innumerable. The spores vary much in size and form and colour and contents. Some are divided into two or many cells, and some are simple. The outer and inner walls are called the *epispore* and *endospore*.

3. The spermatogones are small thallose tubercles, containing a colourless receptacle, within which there arise minute filaments, either simple, when they are termed *sterigmata*, or articulate, when they are termed *arthrosterigmata*. These filaments carry upon their apices very minute bodies, called *spermatia*, which are of various shapes, but generally cylindrical, and which are readily separable and pressed forth in great numbers through a pore in the apex of the spermatogone. The spermatia are supposed to fertilise the apothecia, but their function is not known.

There are also other bodies occasionally found on the thallus. *Pycnides* are small organs of a dark colour, containing filaments called *basidia*, which bear, singly at their summits, minute, generally oblong, bodies, called *stylospores*. These are by many authors supposed to be a sort of secondary fructification, and by others affirmed to be minute fungi. *Cyphellæ* are minute excavations in the under surface of certain lichens. Their function is unknown. When they are apparently filled with white or yellow powder, they are called *pseudocyphellæ*. *Cephalodia* are tubercles of various shapes, which are found on many species,

and contain cells or granula gonima. Their functions are unknown. *Soredia* are powdery protrusions of gonidia and of portions of the interior through the surface of the thallus. In some species, the apothecia are often converted into soredia and are sterile. This formerly constituted a genus *Variolaria*, from which this formation is styled *variolarioid*. The surface of the thallus is often roughened by minute thalline excrescences, which formerly gave rise to a genus *Isidium*, by which name this formation is still distinguished. The obsolete genus *Lepraria* was formed of lichens whose thallus is sterile and pulverulent. The obsolete genus *Spiloma* has been found to consist of certain small fungi parasitic on lichens. Various other foreign growths are occasionally detected on their thallus and apothecia. Sometimes minute algae, or fungi, or portions of mosses will come into view under the microscope; but their structure is evidently very different from that of the lichen with which they are found.

2.—THE USES OF LICHENS.

Their chief design in nature seems to be to form a vegetable soil for the growth of higher plants. It is remarkable that no poisonous principle has ever been found in any species of lichen; yet, with the exception of a few kinds, they are seldom eaten by animals. Snails devour them, and there are microlepidopterous larvæ which feed upon them. On a coral island in the Indian Ocean, I found lichens with the traces of the claws of crabs, which had evidently sought nourishment from them, especially from their apothecia. The omnivorous *Acarus destructor* seems to infest lichens, both in the field and in the herbarium. Some species afford nourishment to the higher animals. What is called the reindeer moss is a lichen, and is well-known as the chief food of the reindeer in Lapland. There are also species in other lands, which are useful as fodder for domestic animals. Even human beings occasionally use some kinds for food, others are employed for medicine, and others again have proved valuable for the dyeing of cloth.

3.—THE GEOGRAPHICAL DISTRIBUTION OF LICHENS.

The growth of lichens in Victoria depends chiefly on the moisture of the various districts of the colony. On the

plains, and even on the hills, north of the Dividing Range, they are much fewer than on the southern slopes of the Range, and on the hills and in the forests towards the coast. Sub-Alpine species are found on the lofty mountains of the Victorian Alps, and sub-tropical species in east Gippsland. This latter district, indeed, from its position near the warm currents of the Pacific Ocean, and sheltered from the Southern Ocean by Tasmania, is physically, rather a part of New South Wales, than a province of Victoria.

The annual firing of the forests has destroyed, and is destroying, many spots which used to be good collecting grounds. As lichens live only by the influence of air and moisture, their growth is intermittent; and many of them increase very slowly, probably continuing in life for centuries, and their reproductive organs are supposed to remain fertile for ages. The destruction of such plants is a loss which cannot be readily made good. Many of them are of more rapid growth, and some of them are annual.

In favourable localities they are found on the earth, on stones, on rocks, on the bark and leaves of trees, and on other plants, even on other lichens, on dead wood, on decayed moss, on fallen leaves, &c., on dry bones, on leather, on glass. Some prefer one substratum and some another, and some grow indifferently on any. Some saxicole lichens grow only on calcareous rocks, some on siliceous rocks, and some on any. Certain kinds love the mountain, and some grow only on Alpine or sub Alpine heights; others love the plain. Some grow only in wet places, others in the dense sunless shade, either on trees or in caves, or under overhanging rocks. Some like the neighbourhood of the sea, others of rivers or lakes. Some live in the water, either constantly or occasionally submerged, in the channels of streams, or on the seashore; and some flourish on the slate roofs of houses.

4.—THE COLLECTING OF LICHENS.

The collecting of lichens is best done in fine, but not too dry, weather. Those which grow closely attached to the bark of plants, may be secured by cutting off the bark with a strong sharp knife. If a piece of wood is taken along with the bark, so much the better, as it will prevent the bark curling up when dried. The tough timber of our fences and decorticated hardwood trees, on which some

grow, will need the use of cold chisel and hammer. Rocks, especially granitic and basaltic, require a light well-tempered steel chisel, by which tolerably thin pieces can be detached from almost any rock by the exercise of a little skill.

All that is necessary to preserve the specimens is, to fold them up at once in soft paper (newspaper will do), to prevent them rubbing against one another in the bag in which they are carried home. Those which grow on earth require more careful management. They need to be collected with a sufficient piece of earth, and tenderly wrapped up. When brought home, the earth needs to be pared off under the specimen to a level surface, and then solidified by the application of a solution of isinglass in spirits of wine. The solution, when liquefied in a bottle under a heat of 25° to 30° C., or 77° to 86° Fahr., is dropped with a camel hair pencil on to the earth till saturation, taking care not to let it touch the thallus, which it would discolour. It should be applied underneath. When, after a day or so, the earth, thus saturated, has become dry on the surface by exposure to the air, the specimen should be placed for a few days under sufficient pressure to keep it in shape; it will thus harden into a form suitable for glueing on to paper, as described below.

5.—THE HERBARIUM.

The mounting and arrangement of lichens will be most conveniently carried out by glueing each specimen (with Russian glue) on to the centre of a piece of writing-paper, with a space below to record the name of the plant, the substratum on which it was found, the place and date of finding, and the name of the collector, and with a space above to record notes of examination. These pieces of writing-paper may be then pinned at each end on to quarto single sheets of white cartridge paper with "lill" pins, six specimens of the same species to the sheet, if small, or two if larger. They can thus be easily detached for special examination. The largest specimens may be glued on to the cartridge paper itself. These sheets of specimens should be enclosed in a quarto cover of cartridge paper, one species, or even one variety to each cover, and the covers, put loose, with the open side inwards, into a quarto book cover of pasteboard (three ply), joined together by a strip of strong white binder's cloth, of such width that each cover, when filled, is two inches thick.

For convenience of moving them to fumigate, &c., the books should be arranged in open boxes in an upright row. The most convenient size of box is that of J.D.K.Z. Geneva cases. The boxes being arranged like shelves, the names of the family, series, genus and sub-genus are written in large characters on the backs of the book covers, and thus at a glance down the herbarium, the needed book can be readily seen and easily taken out. The names of the species enclosed in the books should be written on the left hand lower corner of each doubled cover, and thus any specimen can be conveniently found and replaced without delay.

To preserve the specimens from the ravages of insects, they need to be occasionally exposed to the fumes of bisulphide of carbon in a covered water-tight case. The quantity of fluid required depends on the completeness with which the case is filled by the boxes. A few ounces in a small cup will serve for a case measuring inside 3 ft. x 2 ft. x 1 ft. 3 in., which will contain three boxes.

6.—THE EXAMINATION OF LICHENS.

The examination of lichens for ordinary purposes is most simply and expeditiously carried out by detaching a small portion of thallus or apothecium, or a spermagone, and putting it with a drop or two of water on a glass slide for a short while to soak, then bruizing it down gently with a pen-knife, till it is apparently dissolved. A dry cover is applied, and gently pressed down with a dry knife. The slide is then put under a microscope having a good $\frac{1}{4}$ inch object glass, and an eye piece magnifying from 250 to 300 diameters. When more careful examination is needed for drawings of structure, a fine section will need to be made of the moistened apothecium, &c., with a section cutter, or with a sharp surgeon's knife, under a watchmaker's lens. It will require great nicety to make a good section, neither too thick and opaque, nor too thin and deprived of large spores. Drawings and measurements may be made with a camera lucida and a micrometer. A home made camera lucida can be easily constructed by cementing a half of a glass cover on to the end of a thin plate of brass, having at the other end an aperture to correspond with that of the eye piece, and bent in the middle at *an angle of 45 degrees.*

The chemical re-agents used in examining specimens are decried by some lichenologists as being unreliable. They are, however, valuable assistants in determining species, although they may not be absolutely conclusive taken by themselves. The usual formula by which the solution of iodine (signified by the letter I), is prepared is—iodine, 1 gr., iod. potass., 3 grs., distilled water, $\frac{1}{2}$ oz. For all practical purposes, however, a strong enough solution is made by putting a few grains of iodine into a small phial of water and allowing it to stand a day or so. The solution needs to be kept in a glass-stoppered bottle of dark colour, or covered with tin foil to exclude light. Hypochlorite of lime (signified by the letter C), is prepared by putting a small portion of chloride of lime into a phial of water, and shaking it. When the fluid clarifies, it is ready for use. Hydrate of potash (signified by the letter K), is composed of equal weights of water and caustic potash. It may be well to inform the beginner that when the water is added to the caustic potash, a good deal of heat is evolved. It is well, therefore, to previously warm the bottle, lest the sudden heat should break it. The supply of caustic potash needs to be kept from the air by beeswax round the stopper of the bottle in which it is preserved. The hydrate should also be kept in a stoppered phial, and must be used carefully, as it corrodes clothing, &c. These re-agents may be applied, a drop at a time, by means of thin rods of glass; keeping each rod for its own solution, and wiping them dry on an old rag after using them.

The application of C and K is either to the surface of the plant or to the medulla. The younger part of the thallus is the best for examination. In cold weather, a little heat needs to be applied to hasten the action. This may be done either by placing the phial with the solution in a cup of warm water, or by putting the part under examination close to the mouth and breathing heavily and repeatedly on it after touching it with the solution. First apply C to a portion of the thallus, and note the result. Then to another portion apply K, and, after watching the effect a short while, add C and note the results. To examine the action on the medulla, scrape off a portion of the cortex from another part of the thallus, and apply K and C in the same manner. The more freshly made the solutions are, and the more carefully they are kept from the air, the more reliable are the results.

7.—THE CLASSIFICATION OF LICHENS.

The classification of lichens adopted in the following pages, is that of Nylander, as the most natural, being based upon the consideration of all the parts and organs of the plants, and exhibiting their place in reference to the neighbouring classes of Algæ on the one side, and Fungi on the other.

8.—THE HISTORY OF VICTORIAN LICHENOLOGY

Begins with this century. The first lichens collected in Victoria are recorded in an appendix to Flinders' Voyage to Terra Australis, published in 1814. The collection was made in various parts of Australia and Tasmania by Mr. Robert Brown, who accompanied Captain Flinders in his investigation of the coasts of New Holland in 1802. Brown's specimens were afterwards re-examined by Rev. J. M. Crombie, and the result recorded in the Journal Lin. Soc., 1880.

In 1848 and 1849, Dr. Ferdinand Mueller, now Baron von Mueller, collected a number of lichens in Victoria, and sent them to Dr. Hampe, who determined the species. The list appeared in the Report of the Government Botanist to the Victorian Council, 1854. A second parcel of specimens collected in Gippsland and the Australian Alps, was sent to Dr. Hampe, and enumerated by him in *Schlechtendals Linnæa*, 1856. This list was transcribed into the Government Botanist's Report to the Victorian Legislative Assembly, 1858. These namings by Hampe need revisal, in view of the more minute examination of later lichenology.

A few lichens collected by a visitor from Glasgow, Mr. Hugh Paton, were named by Dr. Stirton, and published by him in the Proceedings of the Royal Society of Victoria, September 1880. They are five in number, and all new to science.

Collections have been made by Messrs. R. Wilhelmi, D. Sullivan, C. Walther, Merrall, C. French, and Mrs. McCann, and forwarded by Baron von Mueller to Europe. The earlier collections were sent to Dr. Krempelhuber, of Blankenberg, on the Hartz Mountains, by whom their names and the descriptions of new species were published in *Den Verhandl. des Kais. Kon. Zool. Bot. Gesel.*, in Wien.,

1880. A list of the names was printed in the Supplement to the eleventh volume of the "Fragmenta Phyt. Austral." Authentic named specimens of most of these are preserved in the Melbourne Botanic Museum. These determinations of Krenpelhuber have been revised by Professor Jean Mueller, of Geneva, in the *Ratisbon Flora or Bot. Zeit.* 1887. The later collections received by Baron von Mueller were sent to Professor Mueller, by whom their names and the descriptions of new species are recorded in the *Ratisbon Flora* from time to time. Authentic named specimens of most of them are preserved in the Melbourne Botanic Museum, and a list of those named from 1881 to 1887 is given by Baron von Mueller in the *Victorian Naturalist*, October 1887.

Collections made by Miss F. M. Campbell (now Mrs. Martin), by Mr. F. Reader, and by Rev. F. R. M. Wilson were sent for determination to Dr. C. Knight, of New Zealand. Subsequently, some have been named and described by Rev. F. R. M. Wilson, and lists of them have appeared from time to time in the *Victorian Naturalist*, October 1887, June 1888, August and September 1889, and April 1890; and latterly many, especially of the crustaceous kinds, have been submitted to Professor Mueller, whose determinations have not yet been published.

In 1891, a paper entitled "Lichens Collected in the Colony of Victoria, by Rev. F. R. M. Wilson," was published by the Linnæan Society of London. Many of the names and descriptions there given are reproduced in the present paper, but some are altered. The alterations of names are noted in each case.

Those localities to which no name is appended have been ascertained by the author.

CLASS LICHENES. MICHELL.

Thallus containing gonidia or granula gonima variously disposed, and very often also crystals of oxalate of lime. Fructification consisting of spores in thecæ; gelatina hymenia in most species becoming blue, in others reddish, and seldom unaffected by the application of an aqueous solution of iodine. Spermagonia in minute thalline tubercles distinct from the apothecia.

FAMILY 1.—COLLEMACEI.

Thallus usually dark in colour, black, brown or olive, sometimes ashy or bluish, various in form, gelatinous in substance, enclosing granula gonima, which are variously arranged, moniliform or enclosed in sacs or dispersed. Apothecia usually rufescent or pale, seldom black, generally lecanorine or biatorine, rarely endocarpoid.

TRIBE I.—LICHINEL.

Thallus blackish or brown, small, filiform, caespitoso-fruticulose or depresso-radiate. Saxicole.

GENUS 1.—EPHEBE, Fr. Born.

Thallus fruticulose, filiform, branched and entangled; granula gonima large, arranged chiefly under the cellulose cortex sub-transversely, two or four or more together. Apothecia endocarpoid in thickened portions of the thallus. Spermata cylindrical.

1. *E. pubescens*, Fr.

Thallus blackish brown, small (about 3 millimetres high, .1 mm. thick), much branched, somewhat decumbent, slightly rugulose, containing brownish green granula gonima. Diacious. Spores 8, colourless, oblong, simple or 1 septate, .011 to .016 × .003 to .004 mm. (Nyl.) Paraphyses indistinct.

Hab. on sub-Alpine rocks, Mount Macedon. Sterile.

Previously named by me (Trans. Lin. Soc. 1890) *Stigonema ephobioides*, Wilson, from a few small imperfectly developed specimens. The lenticular con-colourous bodies then noted by me as apparently connected with the plant, were possibly foreign to it.

GENUS 2.—LICHINA, Ag.

Thallus brownish black, fruticulose, firm; granula gonima bluish; apothecia terminal in sub-globose open thalline receptacles. Spermata oblong. Spores 8, colourless, ellipsoid, simple.

1. *L. pygmaea*, Lightfoot.

Thallus small ($\frac{1}{2}$ inch or a little more), branches flattened towards the apices. Spores $\cdot 022$ to $\cdot 029 \times \cdot 011$ to $\cdot 016$ mm. Nyl. Gelatina hymenia unaffected by iodine.

Hab. on maritime rocks washed by the sea. Rep. Gov. Bot. 1854. Doubtful; probably the next species.

2. *L. confinis*, Ach.

Similar to the preceding, but smaller, in more compact tufts, and with terete branches. Spores $\cdot 0195 \times \cdot 011$ mm. (Nyl.)

Hab. on maritime rocks between high and low water, Sandringham, Barwon Heads, Lorne, Warrnambool.

TRIBE 2.—COLLEMEI.

Thallus various in form, membranaceous, lobate or lacinate or microphylline, sometimes fruticulose, sometimes granulose; rigid when dry, turgid and gelatinous when moist. Apothecia lecanorine, in a few cases biatorine, in still fewer endocarpoid.

GENUS I.—SYNALISSA, D.R. Nyl.

Thallus small, of various forms, incrusting, submembranaceous, granulose or fruticulose. Granula gonima in globular cells. Apothecia innate, lecanorine, or rarely endocarpoid. Spermata oblong.

1. *S. cancellata*, Wilson.

Thallus black or obscurely olivaceous, submembranaceous, cancellate, minutely atro-granulose, effuse at circumference and encrusting the substratum. Granula gonima light green, contained in gelatinous sacs (inky with I), 1-5 in each; also moniliform among fine elementary filaments. Apothecia minute (to $\cdot 25$ mm.), prominent in the thalline granules, one in each, at first endocarpoid, at length rufescent, lecanorine, elevated, disk concave or plane, with thalline margin withdrawn. Spores colourless, ellipsoid or ovoid, simple, with narrow epispore, $\cdot 01$ to $\cdot 012 \times \cdot 004$ to $\cdot 006$ mm. Paraphyses slender; thecae cylindrical; gelatina hymenia I, vinous, then yellow.

Hab. on sub-Alpine rocks and moss, Mt. Macedon.

Previously named by me (Trans. Lin. Soc. 1890) *S. micrococca*, Born. et Nyl.

GENUS 2.—COLLEMA, Ach. Nyl.

Thallus very various, granula gonima moniliform, no distinct cortical layer. Apothecia rufescent, usually lecanorine; hypothecium distinctly cellulose; spores eight, colourless, commonly multilocular, rarely simple.

SUB-GENUS 1.—COLLEMA, *Spores ellipsoid.*

1. *C. lave*, Taylor.

Thallus olivaceous, under surface paler or cinerascens, smooth, rotundo lobate, undulate. Apothecia rufous or fusco-rufous, plane, at length convex, with a thin entire thalline margin. Spores fusiformi ellipsoid, 0.13×0.04 mm., 3 to 5 septate, and also longitudinally divided. Granula gonima moniliform. Gel. hym. blue with iodine.

Hab. among mosses on granitic rocks, M'Crae's Island. Rep. Gov. Bot. 1854. Traawool, Beaconsfield.

Previously named by me (Trans. Lin. Soc. 1890) *Leptogium olivaceum*, Wilson.

Form *granulatum*, Wilson.—Thallus olivaceous or fusco-olivaceous, here and there plumbeous; beneath paler, firm, moderate (one inch wide), smooth, very often near centre or wholly obscurely granulate.

Hab. on bark of trees, Warrnambool, Gippsland, Kew.

Form *fimbriatum*, Wilson.—Thallus crisped at circumference, and isidiosio fringed. Sterile.

Hab. on bark of trees, Warrnambool.

Form *isidiosum*, Wilson.—Thallus plumbeo cœrulescent, here and there olivaceous, membranaceous, thin, plicato undulate, more or less covered with cœsius or obscurely plumbeous isidia.

Hab. on bark of trees, Warrnambool, Gippsland.

2. *C. plumbeum*, Wilson.

Thallus plumbeous, small, complicate, membranaceous, rotundo-lobate, lobes undulate. Apothecia minute, often crowded, rufous brown, sessile, plane, thalline margin entire.

Spores ellipsoideo-fusiform, $\cdot 02 \times \cdot 004$ mm., 5 septate, and also longitudinally divided. Gran. gon. oblongo globose, $\cdot 003$ to $\cdot 005$ mm., moniliform; yellow with iodine. Gel. hym. blue with iodine.

Hab. on mosses on trees, Warburton.

3. *C. furcum*, Ach.

Thallus dark fuscous green or nigro-olivaceous, membranaceous, granulate, lobate, lobes complicate, often undulate; blood-red with iodine. Apothecia fuscous, plane, thalline margin entire. Spores ovoid or ellipsoid, $\cdot 018$ to $\cdot 024 \times \cdot 009$ to $\cdot 011$ mm., 3 septate, irregularly murali-ocular.—B. v. M., *Vic. Nat.*, Oct. 1887, p. 88.

4. *C. atrum*, Wilson.

Thallus black, moderate (to $1\frac{1}{2}$ inch), circumference lobate, complicato squamose, thick, cartilaginous, granulato-corrugate. Apothecia black or dark rufous or sometimes pale, with entire thalline margin, attaining 1 mm. diam. Spores ovate or fusiformi ellipsoid, acuminate at one or both apices, $\cdot 018$ to $\cdot 026 \times \cdot 005$ to $\cdot 006$ mm., 3 to 4 loculate. Thecæ clavate, intensely blue with iodine. Paraphyses slender, crowded.

Hab. on calcareous maritime rocks, Warrnambool.

SUB-GENUS 2.—SYNECHOBLASTUS, *spores elongate.*

1. *S. congestus*, Wilson.

Thallus black or atro-fuscous, small (to 1 inch) cartilaginous, difformi-lobate, lobes rotundate, undulate, circumference elevated, incrassate, arcuate. Apothecia black or pallid or dark red, moderate (2 mm. diam.), plane, with thickened margin, at length convex, immarginate. Spores cylindrical or ellipsoideo cylindrical, sometimes curved, often acuminate at the apices, simple or 1 septate, containing two to five locules, $\cdot 017 \times \cdot 0035$ mm. Paraphyses thick, inarticulate. Gel. hym. blue with iodine, thecæ intensely blue. Gran. gon. conglomerated into sacs, two or three or more in each, not moniliform.

Hab. on mosses, &c., on calcareous maritime rocks, Warrnambool.

2. *S. quadrilocularis*, Wilson.

Thallus fusco olivaceous or nigricant, membranaceous, adhering, lobate, thicker at circumference, crisped. Apothecia moderate, crowded, black or rufous black, plane or somewhat concave, thalline margin entire. Spores cylindrical, rounded at each apex, somewhat curved, $\cdot 02$ to $\cdot 03 \times \cdot 003$ to $\cdot 005$ mm., 3 septate. Paraphyses slender, inarticulate. Gran. gon. mouiliform, or sometimes conglomerated in fours into gelatinous sacs.

Hab. on mosses on sub-Alpine granitic rocks, Mt. Macedon.

3. *S. senecionis*, Wilson.

Thallus green or fuscous green or olivaceous, under surface cærulean green, thin, membranaceous, smooth, shining or somewhat shining, or sometimes granulato rugulose, moderate (2 to 3 inches), rotundo lobate, lobes imbricate, undulato crispate, circumference ascending. Apothecia rufous or testaceo rufous, about 1 mm. diam., often crowded, plane or rather convex, thalline margin entire. Spores elongato fusiform, straight or curved or spirally contorted, $\cdot 03$ to $\cdot 05 \times \cdot 004$ to $\cdot 008$ mm., 3 to 9 septate. Gel. hym. blue with iodine. Gran. gon. oblong or reniform (1 to 2 mm. long), or subglobose (1 mm. diam.)

Hab. on bark of *Senecio bedfordii*, rarely and smaller on bark of *Prostanthera lasianthus*, Mt. Macedon; Lakes Entrance, Gippsland. When young, the thallus is tense and vivid in colour, like a thin, glistening film of green paint.

4. *S. leuocarpus*, Taylor.

Thallus 1 to 3 inches diam., toliaceo membranaceous, smooth, olivaceous, lobes rotundate, undulate and plicate, margin flexuose. Apothecia often crowded, albocarneous; disk convex, pruinose; margin entire, at length concealed. Spores elongato fusiform, often acuminate at apices, 3 to 5 septate, $\cdot 03$ to $\cdot 05 \times \cdot 008$ to $\cdot 01$ mm.

Hab. on trees, Cromb., Journ. Lin. Soc., XVII; Wilson's Promontory, Gov. Bot. Rep., 1854; Krphbr., *Verhandl. Zool. Bot. Gesells.*, in Wien, 1880; by Curdie's Creek, Mt. Macedon, Warburton, Lorne, Glenmaggie, Beaconsfield, Mt. William, Dandenong Hills.

Var. 1 *petraeus*, Wilson.—Obscurely olivaceous or nigricant; lobes smaller, somewhat complicate. Apothecia small,

nigricant, seldom carneo, albo pruinose, disk plane. Spores pluri- (about 7) septate, $\cdot 03$ to $\cdot 04 \times \cdot 004$ to $\cdot 005$ mm.

Hab. on granitic rocks in mountain streams in Tallarook Ranges.

Var. 2 *minor*, Wilson.—Much less and darker than the type; submonophyllous, rotundate, often obscurely furfuraceo granulose. Apothecia minute and much crowded. Spores as in type.

Hab. on trees near Lake Wat Wat, Gippsland.

5. *S. glaucophthalmus*, Nyl.

Thallus olivaceo-fuscous, $\frac{1}{2}$ inch or more diam., here and there fenestrato dissected, scrobiculate and often granuliferous. Apothecia glaucous lilac, plane or somewhat concave, thalline receptacle prominent, margin very thin. Spores as in *S. nigrescens*, to which this species is allied.

Hab. on bark of trees and bushes; *Leptogium glaucophthalmum*, B. v. M., *Vic. Nat.*, Oct. 1887, p. 89; Warrnambool, Mordialloc, Cunninghame, Buninyong, Lake Wat Wat.

6. *S. nigrescens*, Huds.

Thallus black green, thinly membranaceous, submonophyllous, orbicular, depressed, rotundato lobate, radiately rugoso plicate. Apothecia obscurely rufous, plane, crowded, thalline margin entire. Spores fusiformi cylindrical, often pluriseptate, $\cdot 034$ to $\cdot 042 \times \cdot 005$ mm.

Hab. on trunks of trees, Warrnambool, Mordialloc, Cunninghame, Buninyong, Metung.

GENUS 3.—LEPTOGIUM, Fries.

1. *L. biloculare*, Wilson.

Thallus plumbeous, membranaceous, small ($\frac{1}{2}$ inch) laciniato lobate, lobes sinuate and undulate. Apothecia pale rufous, minute (2-7 mm. diam.); thalline margin prominent. Spores fusiformi ellipsoid, bilocular, $\cdot 015 \times \cdot 006$ mm. Gel. hym. blue with iodine.

Hab. on the bark of a tree, Mt. Macedon.

2. *L. sinuatum*, Huds.

Thallus plumbeo-fuscescent, rotundato lobate, reticulato rugulose, lobes crowded, imbricated, margin entire or crenate,

sub-erect. Apothecia brown, scattered, small, sessile, concave, margin smooth, entire, elevated. Spores oblongo ellipsoid, attenuated at apices, irregularly murali locular, $\cdot 02 \times \cdot 008$ mm.

Hab. on mossy rocks, Mt. Macedon, Kihnore, Lorne.

3. *L. lacerum*, Ach. var. *intermedium*, Arn.

Thallus plumbeous, or pallido plumbeous, or fuscescenti plumbeous, very thin, smooth or slightly rugulose, undulate and plicate, laciniato lobate, lobes rotundate or lacerate; margin crisped, irregularly crenate or spatulato fimbriate, fimbria often repeatedly branched. Apothecia pallido rufous, not frequent, small or moderate, margin elevated. Spores oblongo ovoid, narrow at one or both apices, murali locular in typically 3 series, $\cdot 025 \times \cdot 008$ mm.

Hab. on mossy rocks and bushes in bed of stream, Cobden, Mt. Macedon, Beaconsfield, Lorne.

Aspect intermediate, between *lacerum* and *tremelloides*.

Var. 2. *pulvinatum*, Hffm.—Thallus dark brown, smaller, pulvinate, lobes minute, much crowded, denticulato laciniate; sterile.

Hab. on earth, Kew; rare.

4. *L. tremelloides*, L. var. *azureum*, Sw. = *Collema azureum*. Report Gov. Bot. 1854.

Thallus plumbeo glaucescent, here and there fuscescens, smooth, lobate, imbricate and crisped. Apothecia rufous, elevated, margin entire, plumbeous or pallid. Spores ellipsoid, acuminate at apices, 5 septate and also longitudinally divided, $\cdot 016 \times \cdot 006$ mm.

Hab. on trees (*Collema azureum*), McCrae's Island, Rep. Gov. Bot. 1854; Cobden, Lake Elingamite, Black Spur, Mt. Macedon, Warburton, Lorne, Beaconsfield, Lakes Entrance.

Var. 2. *muscitegens*, Wilson.—Darker and firmer than the type, less undulate, ascending.

Hab. on stems of mosses on trees, Warburton, Korumburra.

Var. 3. *isidiosum*, Wilson.—Much smaller than the type, partially covered with a granulose isidium. Apothecia small, occasionally isidiose on margin.

Hab. on mossy bush, Cunninghame.

5. *L. philorheuma*, Wilson.

Thallus more or less obscurely plumbeo cinereous or brown, very thin, to $\frac{1}{2}$ inch wide, sub-ascending, lobate, plicato undulate; margin crenate, sinuate and crisped. Apothecia small (1 to 1.5 mm.), disk more or less obscurely rufous, sometimes black, concave or plane; thalline margin entire, thick, rounded, elevated, at length thin, equal. Spores ovate, 3 septate, and also longitudinally divided, $.015 \times .007$ mm.

Hab. on mosses and rocks in the channels of streams, Curdie's Creek, Lorne, Tallarook.

Named by Dr. Knight as *L. ductylinum*, and so reported by me (Trans. Lin. Soc. 1890).

6. *L. victorianum*, Wilson.

Thallus obscurely plumbeous, here and there rufo-fuscous, under surface nearly concolorous or sub-cinerascent, large (3 inches or more diam.), more or less confusedly rugulose, rotundo lobate, lobes undulate, firm, but in old lobes thick and occasionally fusco-furfuraceous, as if deprived of cortex, sometimes clothed with squamules. Apothecia moderate, sometimes rather large rufous or fusco-rufous, thalline margin sometimes excluded, more generally plicate or granulate or briefly laciniate. Spores ovoideo fusiform, often acuminate at the apices, typically three septate, often with the central locules longitudinally or obliquely divided, $.013$ to $.017 \times .005$ to $.006$ mm. Granula gonima moniliform.

Hab. among mosses, on trees and rocks abundantly, Mt. Macedon, Black Spur, Cobden, Sandringham (one specimen), Warburton, Korumburra.

Allied to *L. chloromelum*, Sw., and perhaps a variety of it.

7. *L. phyllocarpum*, Pers. var. *dudaleum*, Flot.

Thallus fusco plumbeous, here and there pallido plumbeous, firm, lobate, large (three or four in. diameter), longitudinally and very closely undulato rugose, or finely and acutely corrugate, under surface paler. Apothecia dark rufous, often large, thalline margin thick, densely corrugato rugulose, spores ellipsoid, attenuate at each apex, five septate, and also longitudinally divided, $.03$ to $.034 \times .012$ to $.015$ mm. (Nyl.)

Hab. on trees and bushes, Warrnambool, Lake Victoria, Cunninghame, Lake Wat Wat; abundant, but rather rare in fruit.

8. *L. pecten*, Wilson.

Thallus minute, very thin, squamuliform, plumbeous or brown, margin digitato crenate, often pulvinato crowded. Apothecia large for the size of the plant (1.5 mm. diameter), rufescent, concave, with a thin, pallid margin, often immarginate. Spores ellipsoid, three septate with central locules often longitudinally divided, $\cdot 016$ to $\cdot 024 \times \cdot 008$ mm.

Hab. on dead or old bark of trees, not common, Mordialloc, Mt. Macedon, Glenmaggie.

9. *L. Burgessii*, Lightfoot.

Thallus plumbeous or brown, laciniato lobate, complicate, lobes variously margined, undulate and curled, under surface cinerascens and albido tomentellose. Apothecia dark rufous, somewhat large, plane or concave, margin thin, entire, or sub-foliaceo-crenulate. Spores ellipsoid, attenuate at each apex, three septate, and also longitudinally divided, $\cdot 03$ to $\cdot 04 \times \cdot 012$ to $\cdot 015$ mm.

Hab. on bushes and trees and mossy rocks, Curdie's Creek, Warrnambool, Buninyong, Lake Wat Wat, Mount William; not common.

10. *L. inflexum*, Nyl.

Thallus plumbeous or plumbeo cerulescent, membranaceous, dilated, two to three inches diameter, smooth, laciniato incised, margin inflexo convolute, broadly sinuate and crenulate; under surface pallescent, very thinly tomentellose, but wide at margin. Apothecia rufous, plane or somewhat concave, rather large, appressed, foliaceo crenulate. Spores ellipsoid, attenuate at each apex, plurilocular, $\cdot 03$ to $\cdot 036 \times \cdot 013$ to $\cdot 017$ mm. (Nyl.)

Hab. on rock at Waterfall, Upper Maffia.

Var. *limbatum*, Wilson.—Thallus orbicular and rosulate, margin for the most part densely and minutely fimbriate.

Hab. on trees and mossy logs in sub-Alpine localities, Black Spur, Warburton, Mt. Macedon.

11. *L. denticulatum*, *Vic. Nat.*, Oct. 1887, B. v. M.

12. *L. hypotrachynum*, Mull. Arg.

Thallus about 4 centim. wide, laciniae horizontal or ascending, obovate, obtusely lobate, margin entire, thinly coriaceous, fusco olivaceous, both surfaces concolorous, smooth above or slightly rugulose, crowded beneath with polymorphous prominences, obovoid, obtuse, entire or obtusely lobate, exasperate or verruculose tomentellose. Apothecia 2 mm. diam., spores fusiformi ellipsoid, 5 septate, multilocular, $\cdot 025 \times \cdot 01$ mm. Mull. Lich. Beit. XII, 12, Ratisb. Flora.

13. *L. australe*, Hook and Tayl.

Thallus foliaceo membranaceous, thin, blackish olive, smooth, lobes ascending, sub-imbricate, somewhat concave, rotundate, undulate, entire, under surface paler, sub-tomentose. Apothecia elevated, black, at length convex, margin thin, entire. McCrae's Island, Rep. Gov. Bot. 1854.

14. *L. rugatum*, Hook and Tayl.

Thallus gelatinous membranaceous, 3 inches diam., fuscous green, covered with close longitudinal plaits; lobes crowded, ascending, oblongo rotundate, crenate, somewhat concave, with minute granulate stipitate isidia expanding into thalline lobes, sterile.

Hab. on trees, McCrae's Island, Rep. Gov. Bot. 1854.

FAMILY II.—MYRIANGIACEI.

GENUS I.—MYRIANGIUM, Mnt. and Berk.

Thallus black, noduloso pulvinate, cellulose, unstratified. Apothecia sublecanorine, sphaeroideo cellulose. Spores 8, colourless, irregularly septate.

1. *M. duriæi*, M. and B. = *M. duriæi*, of De Bary.

Thallus black, opaque, small, tuberculato glomerate or nodoso confluent, often depresso pulvinate. Apothecia minute, black, slightly impressed. Spores oblong or oblongo ovoid, variously septate, $\cdot 017$ to $\cdot 024 \times \cdot 007$ to $\cdot 008$ mm.

Hab. on bark of trees, Mount Macedon, Sandringham, Korumburra, Kilmore.

2. *M. dolichosporum*, Wilson.

Thallus black, opaque or slightly shining, small (2 to 5 mm. wide and 2 mm. high), unequal. Apothecia numerous, nearly covering the thallus and concolorous with it, stipitate; epithecium subrufescent, plane or concave, to 1 mm. broad, with rotundo obtuse thalline margin; stipe sometimes 1 mm. long, tapering downwards. Thecæ spheroidal, dispersed in the cellular substance of the epithecium. Spores cylindrical, simple or obsolete septate, arcuate, somewhat acuminate at apices, with minute guttæ arranged in the longitudinal axis, 0.4×0.06 mm. Gran. gonim. 0.02 to 0.07 mm. diam., often conglomerate. Texture of thallus fuscous, cellular, cells angular, 0.03 to 0.05 mm. diam. Cells in epithecium spherical.

Hab. on twigs of *Hymenanchera banksii*, Maffra.

The whole plant is often covered with the scyphophoroid apothecia standing out in all directions, and of various sizes and stages of development. The epithecium is almost identical in texture with the epithallus, but is generally concave and slightly rufescent. In old apothecia it is worn into cavities, which give it a granulato rugulose appearance. Both thallus and apothecia contain granula gonima, usually conglomerate. When a dried specimen is submerged in water, there arise from it on all sides streams of minute air bubbles for a considerable time, showing the porous nature of the plant. It does not, however, appreciably increase in size when moistened as the Collemacei do.

FAMILY III.—LICHENACEI.

Thallus various in colour, white, whitish, cinerascens, flavicant, rufous, fuscous, very rarely nigricant, and various in form, filamentous, foliaceous, squamose, crustaceous, pulverulent or evanescent. The gonidial stratum very generally of true gonidia. Apothecia various in form, stipitate, lecanorine, peltate, patellulate, lirellate or pyrenocarpous.

SERIES I.—EPICONTODEI.

Apothecia with the spores naked, collected into a sporal mass on the surface.

TRIBE 1.—CALICIEL.

Thallus crustaceous, granulose or obsolete, yellow or flavovirescent, or cinerascens, or whitish, or none. Apothecia cupuliform, sessile or stipitate.

GENUS 1.—SPHINCTRINA, Fr. pr. p. D. N.

Thallus none. Apothecia parasitic on *Pertusariae*, globoso turbinate, shining, black, sessile or shortly stipitate. Spores 8, nigrescent, simple.

1. *S. microcephala*, Nyl.

Apothecia black, globoso turbinate, briefly stipitate, nearly sessile, capitula small (about .1 mm. broad), spores nigricant, fusiformi ellipsoid, nearly globose, but acuminate at apices, epispore thick, reddish, .01 to .012 × .004 to .008 mm.

Hab. on some pertussaria, on bark of *Hymenanchera banksii*, Maffra.

Form *tenella*, Wilson.—Like the type, but with a smaller capitulum and longer stipe (to .5 mm.)

Hab. along with type, Maffra.

GENUS 2.—CALICIUM, Ach. Nyl.

Thallus granulose, powdery, crustaceous, squamulose, or altogether evanescent. Apothecia generally black, stipitate or sessile, capitula globose, or turbinate, or cupular. Spores fuscous or nigricant. Spermatia short, oblong.

1. *C. chrysocephalum*, Ach.

Thallus citrine or obsolete. Apothecia small (.6 mm. high), black, stipe slender (.06 mm. thick). Capitulum small (.12 mm. broad), turbinate; beneath citrino suffused. Sporal mass umber brown; spores fuscous, globose, .003 to .006 mm. diam.

Hab. on decorticated decaying eucalyptus, near river, at Maffra, Kilmore.

Var. *filare*, Ach.—Stipe longer and more slender (to .8 × .4 mm.); capitulum smaller; sporal mass protruding upwards to a great height.

Hab. along with type, Maffra.

2. *C. phæocephalum*, Borr. var. *phædrosporum*, Wilson.

Thallus white, or whitish, with pale glaucescent verrucose congested granules, which are sometimes dissolved into citrine soredia. Apothecia atro-fuscous, with slender stipe (about .2 mm. high, .1 mm. thick), the upper part citrino suffused; capitulum hemispherico-turbinate or sub-globose; margin citrino suffused; sporal mass from fulvous to umbrine. Spores dilutely nigrescent, very nearly colourless, delimited by a dark line; form variable, globose or ellipsoid, simple, nucleated, diameter .002 to .004 mm.

Hab. on decaying decorticated eucalyptus, near Kilmore.

I am doubtful whether the granules of the thallus belong to this lichen, or are an undeveloped form of some other. Perhaps the plant is of a new species, which may be called *C. phædrosporum*.

3. *C. niveum*, Wilson.

Thallus snowy white, thick, or cinerascens albid, thinner, effuse, rimulose with convex areolæ. Apothecia minute (.5 to .8 mm. high), stipe slender (.07 mm. thick), either all whitish or partly hyaline and partly fuscous, or all fuscous, or all black, sometimes furcate. Capitulum hemispherico-lenticular, black, about .25 mm. broad, sometimes divided into two or three or more lobes. Spores dilutely nigrescent, fusiformi ellipsoid, or oblong, compressed, simple, .004 to .006 × .002 to .0025 mm., paries thick. Gel. hym. with iodine vinous yellow.

Hab. on dead bark of living eucalyptus, Cunninghame, Maffra, Beechworth.

Perhaps a variety of *C. pusiolum*, Ach.

4. *C. Victorie*, C. Knight.

Thallus white or whitish, or cinerascens, more or less marked, effuse. Apothecia all black, .5 to 1 mm. high, stipe slender (.1 mm. thick) and a little thicker at the base. Capitulum turbinate lenticular or hemispherico lenticular, .25 to .5 mm. broad. Spores fuscous or fuscous, fusiformi ellipsoid, compressed, simple, .005 to .008 × .002 to .003 mm., when viewed from the side bacillar, .0015 mm. wide; paries thick, defined by a dark line on the outside.

Hab. on decaying decorticated eucalyptus, Croydon, Kew, Warnambool, Warragul, Black Spur, Lakes Entrance, Mt. William, Tallarook, Mt. Macedon, Beechworth; frequent.

Allied to *C. parietinum*. Somewhat variable. *C. jejunum* reported by me (Trans. Lin. Soc. 1890), is now judged by me to be a not clearly marked form of *C. Victoriae*.

5. *C. parvulum*, Wilson.

Thallus white or whitish, sub-determinate. Apothecia all black, $\cdot 4$ mm. high, stipe slender ($\cdot 05$ mm. thick). Capitulum lenticular, $\cdot 16$ mm. broad. Spores dilutely nigrescent, ellipsoid, simple, $\cdot 003$ to $\cdot 006 \times \cdot 0015$ to $\cdot 0025$ mm., paries thin, black.

Hab. on decorticate eucalyptus, Maffra, Mt. Macedon, Beechworth.

The thallus looks like a thin coat of whitewash, on which the densely black apothecia, though very minute, are clearly visible. The outline of the spores is remarkable for its blackness, being in this respect like *C. Victoriae*.

6. *C. contortum*, Wilson.

Thallus whitish, very thin. Apothecia all black, 1 mm. high, stipe $\cdot 1$ mm. thick, contorted. Capitulum hemispherico lenticular. Spores dilutely nigrescent, fusiformi ellipsoid, simple, $\cdot 004 \times \cdot 0014$ to $\cdot 002$ mm.

Hab. on decorticate decaying eucalyptus, Lakes Entrance.

Allied to *C. Victoriae*, which it resembles in its apothecia, but the capitula are smaller, the spores also are smaller and narrower, and different in colour.

7. *C. gracillimum*, Wilson.

Thallus indicated by a whitish spot. Apothecia all black, small ($\cdot 8$ mm. high); stipe very slender ($\cdot 06$ mm. thick); capitulum minute ($\cdot 1$ mm. broad); turbinato lenticular. Spores more or less dilutely nigrescent, ellipsoid or fusiformi ellipsoid, uniseptate, $\cdot 002$ to $\cdot 004 \times \cdot 001$ to $\cdot 002$ mm., with a locule in each cell.

Hab. on decaying decorticated *Aster argyrophyllus*, Mt. Macedon.

The apothecia are extremely minute, being visible only under a powerful lens.

8. *C. deforme*, Wilson.

Thallus cinerascens, thin, granulose. Apothecia black, deformed by thalline and other granules, 1 mm. high, or a little more; stipe .2 mm. thick; capitulum turbinato lenticular, to .5 mm. broad. Sporal mass black, protruding, sometimes extending far on one side. Spores nigrescent, fusiformi ellipsoid, uniseptate, septum often indistinct, .006 to .008 \times .0025 to .004 mm.

Hab. on decaying decorticated eucalyptus, Lakes Entrance. The apothecia have a deformed appearance, unlike the ordinary neatness of the genus. Its surface seems to be glutinous, readily retaining any granules or other particles that fall on it.

9. *C. roseo-albidum*, Wilson.

Thallus rosy-whitish, thick, minutely cancellate, chryso-gonic. Apothecia minute (.7 mm. high), all black; stipe slender (.06 mm. thick); capitulum lenticular (.2 mm. broad). Spores nigrescent, oblong or oblongo ellipsoid, apices rotundate, uniseptate, .005 or more \times .002 to .003 mm.

Hab. on decayed decorticated eucalyptus, Maffra, Kilmore. The thallus covers a good part of the tree, and when bruised, it becomes a deep yellow.

10. *C. capillare*, Wilson.

Thallus white, thin, or very thin. Apothecia all black, .1 mm. high; stipe slender (.1 mm. thick); capitulum turbinato lenticular, .3 to .4 mm. broad. Spores nigrescent, oblong or ellipsoid, uniseptate, .005 \times .0025 mm.

Hab. on decaying decorticated eucalyptus, Mt. Macedon, Warburton, Maffra.

Perhaps a variety of *C. subtile*, Pers., of which I reported it a variety (Trans. Lin. Soc., 1890).

11. *C. biloculare*, Wilson.

Thallus whitish or cinerascens, thin. Apothecia, all black, .8 to .1 mm. high; stipe, .1 mm. thick; capitulum lenticular or sub-turbinato lenticular, .3 to .4 mm. broad. Spores fuscescent or fusco nigrescent, ellipsoid, or sub-fusiformi ellipsoid, bilocular or obsoletely bilocular or simple, with septum not visible, epispore thickish, .005 to .008 \times .002 to .0035 mm.

Hab. on decaying decorticated eucalyptus, Warrnambool, Maffra, Bright.

Perhaps a variety of *C. subtile*, Pers., of which I reported it a variety (Trans. Lin. Soc., 1890).

12. *C. obovatum*, Wilson.

Thallus cinerascens, thin. Apothecia black, to .8 or 1 mm. high; stipe to .08 or .1 mm. thick; capitulum obovate or turbinate, .2 to .3 mm. broad. Spores nigrescent, ellipsoid, uniseptate, each cell containing a globular locule, septum not always visible, .005 to .012 \times .003 to .004 mm.

Hab. on eucalyptus wood in mountain regions, Mt. Macedon.

Distinct by the obovate capitulum.

13. *C. piperatum*, Wilson.

Thallus albido cinerascens or cinereous, thin. Apothecia black, sub-sessile, .2 mm. high; stipe thick (.1 mm.); capitulum lenticular, disk plane, .25 mm. broad. Spores fusco nigrescent, oblong, uniseptate, each cell containing a globular locule, .004 to .008 \times .0025 to .005 mm.

Hab. on eucalyptus wood, both trees and fences, common, Mt. Macedon, Kilmore, Beechworth.

14. *C. nigrum*, Schær var. *minutum*, Knight.

Thallus obscurely cinerascens, granulose. Apothecia all black, small (.5 mm. high); stipe thick (.1 to .12 mm.); capitulum turbinate cylindrical, disk pruinose, .3 to .7 mm. broad. Spores nigrescent, ellipsoid, uniseptate, constricted in the middle, each cell containing a globular locule, .004 to .012 \times .002 to .006 mm.

Hab. on the horizontal surface of decaying eucalyptus fences, Kew, Maffra, Oakleigh.

15. *C. quercinum*, Pers. var. *bulbosum*, Wilson.

Thallus albido cinerascens. Apothecia to .1 mm. high; stipe to .2 mm. thick, capitulum glubose, .5 mm. diam., cinereo pruinose beneath. Spores fusco nigrescent, subfusiformi ellipsoid, .006 to .012 \times .003 to .005 mm., uniseptate, septum often indistinct, cells containing each a nigrescent locule, episporium distinct, rubescent.

Hab. on decaying decorticated eucalyptus, Mt. Macedon.

Reported by me (Trans. Lin. Soc.) as *C. bulbosum*, and perhaps a variety of *C. quercinum*.

Var. 2. *microcarpum*, Wilson.—Thallus cinereous. Apothecia small, 3 to 4 mm. high; stipe black, 1 to 2 mm. high, .05 to 1 mm. thick; capitulum turbinate, disk flat, 1 to 2 mm. broad, margin cinerascens or albido cinerascens. Spores fuscous, 1 septate, paries thick, constricted in middle; apices rather acuminate, $.008 \times .003$ mm.

Hab. on decaying eucalyptus stump, near Tallarook.

Var. 3. *Clarensis*, Wilson.—Thallus whitish or cinerascens, of medium thickness. Apothecia black, 8 mm. high, stipe 1 mm. thick, capitulum 3 mm. broad, turbinate lenticular, margin whitish. Spores fuscous or fuscous, ellipsoid, narrow at apices, often constricted in middle, uniseptate or bilocular, $.005$ to $.008 \times .002$ to $.0035$ mm.

Hab. on decaying decorticated eucalyptus, Bright, Beechworth.

16. *C. curtum*, Borr.

Thallus whitish, thin or evanescent. Apothecia to 1.8 mm. high, but often much less, stipe to 2 mm. thick, capitulum turbinate, to 6 mm. broad, albo suffused beneath. Sporal mass black, protruded upwards. Spores nigricant, ellipsoid, uniseptate, $.005$ to $.01 \times .002$ to $.003$ mm.

Hab. on decaying decorticated eucalyptus and old hardwood fences, frequent and abundant, Lorne, Mt. Macedon, Oakleigh, Black Spur, Maffra, Bright, Mordialloc.

17. *C. trachelinum*, Ach. var. *elattosporum*, Wilson.

Thallus obscurely cinerascens or albescent. Apothecia very various in size, to 2 mm. high; stipe at the base .25 mm. thick; capitulum globose or turbinate, to 5 mm. broad, rufous at margin and upper part of stipe and even the disk. Spores $.003$ to $.008 \times .002$ to $.004$ mm.

Hab. on decaying decorticated eucalyptus and fences, Cobden, Warburton, Warragul, Maffra, Lorne, Cunninghame.

The dimensions of the spores are half of those described by Nylander. This is in Victoria the commonest species of this genus, and often grows in large patches on the trees, covering many square feet with abundant apothecia, sometimes making the tree seem as though clothed with short hair.

Var. 2. *meiocarpum*, Wilson.—Thallus whitish, thin. Apothecia small, about .8 mm. high; stipe about .1 mm. thick; capitulum turbinato lenticular .3 mm. broad; margin and upper part of stipe rufous. Spores fuscous, ellipsoid, constricted in middle, uniseptate, with minute loculi in each cell, .006 to .007 × .003 mm.

Hab. on decorticated lightwood tree, Kilmore.

18. *C. aurigerum*, Wilson.

Thallus white or whitish, somewhat thick. Apothecia small, stipe black .2 to .8 mm. high, .05 to .1 mm. thick; capitulum wholly covered with flavescent powder, lenticular, .4 mm. broad. Spores nigrescent or fuscous, ellipsoid, uniseptate, rather constricted in middle, containing a locule in each cell, .005 to .007 × .002 to .004 mm.

Hab. on decaying eucalyptus wood, Mt. Macedon.

Possibly only a variety of *C. roscidum*.

19. *C. roscidum*, Flk. var. *eucalypti*, Wilson.

Thallus cinerascens, here and there flavo sorescens and then sterile. Apothecia to 1.3 mm. high, stipe black, .1 mm. thick; capitulum turbinato, beneath more or less flavo virescent, to .3 mm. broad. Spores fuscous or more or less dilutely nigrescent, defined by a black line, ellipsoid, narrow at each apex, often constricted at middle, uniseptate, containing a paler locule in each cell, .005 to .009 × .003 to .005 mm.

Hab. on dead bark and decaying wood of eucalypti, Beechworth, Mt. Macedon.

20. *C. roscidulum*, Nyl.

Thallus white, thick, here and there rufescent (query alien?). Apothecia .9 mm. high, stipe .1 mm. thick; capitulum turbinato lenticular, .4 mm. broad; margin and upper part of stipe golden green. Spores fuscous, ellipsoid, constricted at middle, uniseptate, .003 to .006 × .002 to .003 mm.

Hab. on decayed eucalyptus stump, Kilmore.

Probably a mere variety of *C. roscidum*.

21. *C. hyperellum*, Ach.

Thallus flavo virescent, granulose or sub-leprose. Apothecia black; capitulum globoso-lentiform; stipe black, elongate; sporal mass black or umber black. Spores nigrescent, ellipsoid, uniseptate, $\cdot 009$ to $\cdot 016 \times \cdot 004$ to $\cdot 006$ mm. (Nyl.)

Hab. on bark of trees. B. v. M., *Vic. Nat.*, Oct. 1877, p. 89.

Var. *validius*, C. Knight.—Thallus yellow or sulphureo cinerascens, thickish, verrucoso unequal. Apothecia all black; stipe short and thick (to $\cdot 5$ mm. high, $\cdot 3$ mm. thick); capitulum turbinato lenticular, disk lecideine, to $\cdot 5$ mm. broad. Spores fuscous, ellipsoid, sub-acuminate at each apex, somewhat constricted in the middle, uniseptate, $\cdot 007$ to $\cdot 013 \times \cdot 003$ to $\cdot 006$ mm.

Hab. on wood and decorticated decaying trunks of eucalyptus, Maffra, Lakes Entrance, Bright, Beechworth.

Var. 2. *perbreve*, Wilson.—Thallus flavo virescent, crustaceous, rugose. Apothecia very short, nearly sessile. Sporal mass black, protruded horizontally until the apothecia are often conjoined. Spores fusco nigrescent, ellipsoid, often narrower at each apex, somewhat constricted in the middle, uniseptate, $\cdot 007$ to $\cdot 015 \times \cdot 003$ to $\cdot 0075$ mm.

Hab. on decaying eucalyptus wood, Maffra.

22. *C. tricolor*, Wilson.

Thallus sulphureous, leproso granulose. Apothecia black, small (to $\cdot 75$ mm. high); stipe 1 mm. thick; capitulum turbinato globose, $\cdot 2$ to $\cdot 5$ mm. broad, margin white. Spores fuscous, fusiformi ellipsoid, sub-acuminate at each apex, somewhat constricted in the middle, uniseptate, with a fusco nigrescent locule in each cell, $\cdot 008$ to $\cdot 012 \times \cdot 003$ to $\cdot 005$ mm.

Hab. on decaying decorticated eucalyptus, Warrnambool, Lakes Entrance.

23. *C. flavidum*, Wilson.

Thallus yellow or sulphureous, crustaceous, smooth, nearly shining. Apothecia black, but with margin, and often the stipe tinged with the thalline colour, 1 mm. high; stipe $\cdot 5$ mm. thick, tapering downwards; capitulum globoso turbinate. Sporal mass black, protruded. Spores fusco

nigrescent, ovoid or sub-fusiformi ellipsoid, uniseptate, episore rubescent, cells fuscous, containing each one or two nigrescent locules, $\cdot 008$ to $\cdot 01 \times \cdot 003$ to $\cdot 004$.

Hab. on decorticated eucalyptus, Lakes Entrance.

GENUS 3.—CONIOCYBE, Ach. Nyl.

Thallus leprose or powdery, effuse or evanescent. Apothecia yellow or pale, not black, stipitate, excipulum very open. Spores usually spherical, colourless or flavescent, forming the globoso pulverulent capitulum.

1. *C. citriocéphala*, Wilson.

Thallus white, thin. Apothecia minute; stipe black, slender, 1 mm. high, $\cdot 06$ thick, often less. Capitulum flavo virescent, turbinate, at length globose, to $\cdot 2$ mm. diameter, becoming fuscous and turbinate when stripped of the sporal mass. Spores colourless or dilutely flavid, briefly oblongo ellipsoid or spheroidal, $\cdot 02$ to $\cdot 04 \times \cdot 02$ to $\cdot 03$ mm.

Hab. on dead wood and dead bark of trees, Lakes Entrance.

2. *C. ochrocephala*, Wilson.

Thallus whitish, often with green leprose granules. Apothecia with slender fuscous stipe, $\cdot 6$ to $1\cdot 2$ mm. high, $\cdot 05$ to $\cdot 08$ mm. thick, often bifurcate; capitulum globose, pale ochre, $\cdot 25$ mm. diameter. Spores colourless or dilutely fuscous, globose, $\cdot 002$ to $\cdot 003$ mm. diameter, containing a central locule.

Hab. on decaying decorticated *Aster argyrophyllus*, *Senecio bedfordii*, and eucalyptus, Mt. Macedon and Korumburra.

3. *C. rhodocephala*, Wilson.

Thallus white or whitish or cinerascens or cinereous or evanescent. Apothecia often caspitoso congested; stipe scarlet or hyaline, at length fuscous or black and pruinose, contorted and compressed, to 2 mm. high, $\cdot 2$ mm. thick, sometimes furcate or two partly coalescent. Capitulum globose, obscurely rufous or fuscous, at length rose or flesh colour, pruinose, rarely albid, $\cdot 4$ to $\cdot 8$ mm. diameter. Spores very numerous,

colourless, ellipsoid or ovate $\cdot 003$ to $\cdot 006 \times \cdot 0015$ to $\cdot 004$ mm., bilocular or placodine or uniseptate, with a locule in each cell, epispore thick. Paraphyses numerous, distinct.

Hab. on dead wood or bark of tree, Lakes Entrance.

This species is remarkable for the form of its spores. All the genus hitherto described have spherical simple spores.

The var. *rubens* reported by me (Trans. Lin. Soc.), having been since found in larger quantity, proves to be scarcely more than a juvenile form.

4. *C. gracilentu*, Ach. var. *leucocephala*, Wilson.

Thallus green, conglomerato leprose. Apothecia with stipe long and tender ($1\cdot 5$ to $2\cdot 5 \times \cdot 1$ mm.), fusco nigricant, opaque, and capitulum small, sporal mass white, irregularly clothing the capitulum and the upper part of the stipe. Spores colourless, minute, spheroidal, $\cdot 002$ to $\cdot 003$ mm. diameter.

Hab. on earth, Fernshawe, Mrs. Martin, March 1891.

GENUS 4.—TRACHYLIA, Fr. pr. p. Nyl.

Thallus thin, granulose or subleprose, or foreign. Apothecia black, sessile, cupuliform, open, sporal mass black. Spores nigricant or fuscous black, ellipsoid or oblong, uniseptate, rarely pluriseptate.

1. *T. lecanorina*, Wilson.

Thallus cinerascens, verruculoso leprose, passim verrucoso soredate, gonidia moderate and abundant. Apothecia small (to $\cdot 5$ mm. broad), crowded, elevated in thalline receptacles. Sporal mass black, abundant, often much protruded and connecting the apothecia. Spores fusco nigricant or nigrescent, or nearly colourless, ellipsoid, uniseptate, $\cdot 01$ to $\cdot 02 \times \cdot 006$ to $\cdot 01$ mm.

Hab. on old eucalyptus fences, Cheltenham, Yalla-y-poorra, near Streatham.

This plant bears at first sight a great resemblance to *Lecanora atra*.

2. *T. viridilocularis*, Wilson.

Thallus obscurely cinerascens. Apothecia black, somewhat elevated, $\cdot 3$ mm. high, $\cdot 3$ mm. broad. Sporal mass

abundant. Spores nigricant or virescenti nigricant, irregularly ellipsoid, uniseptate, $\cdot 01$ to $\cdot 02 \times \cdot 008$ to $\cdot 01$ mm., with one or rarely two locules in each cell.

Hab. on sawn eucalyptus rails, Kew.

This lichen is associated with *Calicium nigarum*, var. *minutum*, the *Calicium* on the more decayed horizontal face of the squared rail, and the *Trachylia* on the perpendicular face. The spores are tinged bottle green.

3. *T. emergens*, Wilson.

Thallus white or whitish, thin, smooth, somewhat shining. Apothecia seem to emerge from among the fibres of the wood, and at length barely stand out above the thallus, to $\cdot 5$ mm. broad. Spores fusco nigricant, adhering closely together, ellipsoid, about $\cdot 005 \times \cdot 003$ mm., but very various in size, uniseptate, with a locule in each cell.

Hab. on eucalyptus rails in sub-Alpine regions, Mount Macedon. Found also on Mount Lofty, in South Australia, and Mount Wellington, in Tasmania.

4. *T. Victoriana*, Wilson.

Thallus cinerascens, thin, effuse. Apothecia typically sessile, but often very briefly stipitate, to $\frac{1}{4}$ mm., high, disk generally sulphureo pruinose, to $\frac{1}{4}$ mm. broad. Spores fuscous, oblongo ellipsoid, $\cdot 005$ to $\cdot 006 \times \cdot 003$ to $\cdot 004$ mm., uniseptate, with a nigrescent locule in each cell.

Hab. on old eucalyptus rails. The fuscous episporium readily rubs off, leaving the spore nigrescent, ellipsoid, narrow at each apex, and smaller, $\cdot 004$ to $\cdot 005 \times \cdot 002$ to $\cdot 003$ mm.

5. *T. exigua*, Wilson.

T. exigua, Wilson (Trans. Lin. Soc., 1890) on further examination proves not to be a *Trachylia*.

TRIBE 2.—SPHEROPHOREI.

Thallus fruticulose, ramose and ramulose, the apices subglobo-incrassate, enclosing the apothecia, which are nuclei-form, enclosed, ultimately exposed by the bursting of the thalline covering.

GENUS 1.—SPHÆROPHORON, Pers.

Thallus cæspitose fruticulose, smooth, polished, fragile. Apothecia in the apices of the thallus, receptacle irregularly dehiscent. Spores nigricant or violaceo nigricant, spherical or sub-globose, covered with a black powder.

1. *S. australe*, Laur. = *S. ceratoides*, Hampe.

Thallus to 2 inches long, pallid, ramose, branches compressed, explanate, often distichously ramulose, beneath albicant, rugose. Receptacle $\cdot 6$ to $\cdot 12$ mm. broad, lenticulari compressed, external margin above cristato crenate. Spores $\cdot 011$ to $\cdot 015$ mm. diam.

Hab. Sealer's Cove, by Dr. F. Mueller; Moe; *S. ceratoides*, Hampe, in Linnæa (1856), XXVIII, p. 217; *S. australe*, Müll. Lich. Beitr., XVII, p. 1; B. v. M., *Vic. Nat.*, 1887, p. 89.

Var. *proliferum*, Wilson.—Thallus cæruleo pallid on upper surface, convex, smooth, nearly shining, under surface white, fossulato canaliculate or scrobiculato unequal, to 3 inches long, sub-pinnatifid, branches linear, 2 to 7 mm., broad, variously divided. Apothecia on the under surface of the thallus, the margin branching and proliferous once or twice.

Hab. on the trunks of large trees in shady woods, Black Spur, Warburton.

The plant grows horizontally from the tree, then droops downwards, and then bends gracefully upwards, displaying the apothecia on the under side of the thallus. The proliferous branches grow, one or more, from the margin of the apothecium.

2. *S. compressum*, Ach.

Thallus pallido albicant, ramose, plano compressed. Apothecia obliquely minute on the apices; receptacle lacero dehiscent, or discoid and open. Spores nigricant, spherical, $\cdot 007$ to $\cdot 011$ mm. diam. (Nyl.)

B. v. M., *Vic. Nat.*, Oct. 1887, p. 89.

3. *S. coralloides*, Pers.

Kremp., in *Verhand. Zool. Botan. Gesellsch.*, in Wien, 1880, p. 329. A mistake for *Stereocaulon ramulosum*, according to Prof. J. Mueller, in *Ratisbon Flora*, 1887, No. 8.

4. *S. tenerum*, Laur.

Thallus pale or whitish, terete, slender, very much branched, branches fine and intricate. Apothecia small (.1 to .2 mm.) on the primary branches: thalline receptacle persistent, only slightly dilated. Spores nigricant, or smeared with a friable nigricant pigment. Diam. .007 to .008 mm. (Nyl.)

Kremp., in *Verhandl. Zool. Bot. Gesells.*, in Wien, 1880, p. 329. According to Prof. J. Mueller (in *Ratisbon Flora*, 1887, No. 8), a specimen from Mt. Ellery is rightly determined, but specimens from Black Spur and Yarra Yarra are *Cladina aggregata*.

SERIES 2.—CLADODEL.

Thallus generally erect. Apothecia terminal on podetia, rarely sessile; biatorine, rarely lecanorine. Spores 8, colourless, usually oblong and simple, sometimes elongate and septate. Paraphyses distinct.

TRIBE 3.—BEOMYCEL.

Thallus horizontally expanded, crustaceous. Apothecia pale or rufescent, sessile or podetiiform stipitate. Spores simple or septate.

GENUS 1.—GOMPHILLUS, Nyl.

Thallus very thin, consisting of gonidia and filaments irregularly conglutinated. Apothecia stipitate, small, corneous. Spores filiform, multiseptate. Paraphyses indistinct.

1. *G. beomyceoides*, Wilson = *Patellaria Wilsoni*,
Mull. Arg.*

Thallus cinereous or virescent, effuse, either very thin and somewhat shining, or rather thicker and crasso isidioso granulate. Gonidia various in size and form, conglomerated into gelatinous globules. Apothecia of a tenacious, horny texture, biatorine, sometimes margined by the white hypothecium, scattered or conglomerated, depresso globose, to 1.5 mm. diam., smooth, rufo fulvescent, pale when young,

* Lich. Beitr., in Flora 1888, No. 1435.

and dark in age, sub-sessile or stipitate, stipe to $\cdot 5$ mm. high and $\cdot 5$ mm. thick, with sometimes two or three capitula on one stipe. Spores, eight in cylindrical thecæ, aciculari filiform, about $\cdot 14$ mm. long, pluriseptate.

Hab. on roots and trunks of trees, upon mosses and bark, and jungermannias and lichens; also on the earth upon dead leaves, &c., in shady mountain forests, Black Spur, Mt. Macedon, Warragul.

GENUS 2.—*BÆOMYCES*, Pers.

Thallus crustaceous, powdery, granulose or squamulose. Apothecia biatorine, sessile or stipitate.

1. *B. rufus*, D. C.

Thallus albo virescent or albido glaucescent, thin, effuse, minutely granulose or squamulose or leprose, granules depressed (K yellow). Apothecia carneo rufescent or carneo fusciscent, somewhat convex, immarginate, stipe moderate or very short, whitish. Spores, 6 or 8, oblongo ellipsoid, simple.

B. v. M., *Vic. Nat.*, Oct. 1887, p. 89.

2. *B. fusco carnea*, Wilson.

Thallus pallid, granuloso verrucose, granules sometimes depressed. Apothecia rufo fusciscent, quasi pruinose, 1 to 2 mm. broad, convex, margined by the hypothecium. Stipe white, nude, short (less than 1 mm. high). K. thal. and apoth. yellow, then blood red. Spores ellipsoid, simple, $\cdot 008$ to $\cdot 01 \times \cdot 003$ to $\cdot 005$ mm.

Hab. on clay ground, Kilmore.

3. *B. roseus*, Pers.

Thallus whitish, granulose, effuse or determinate. Apothecia roseo carneous, or albo carneous, nearly globose, about 2 mm. broad, stipe whiter or nearly white, subterete. Spores six or eight, fusiformi oblong or fusiform, simple, $\cdot 011$ to $\cdot 026 \times \cdot 0025$ to $\cdot 003$ (Nyl.) Paraphyses slender.

Hab. on bare earth, chiefly clay. B. v. M., *Vic. Nat.*, Oct. 1887, p. 89.

(See note on next species.)

4. *B. fungoides*, Ach.

Thallus whitish, granulose, margin of granules spreading, thin, continuous. Apothecia roseo carneous or albo carneous, sub-globose, or globoso clavate, or difformi clavate, moderate or large (2 to 4 mm. broad); stipe long (4 to 8 mm.), whiter or nearly white, subterete. Spores oblong or fusiform, simple, $\cdot 011$ to $\cdot 023 \times \cdot 0035$ mm. Paraphyses slender.

Hab. on earth, chiefly clay, in mountain regions, Otway Ranges, Black Spur, Warburton, Mt. Lookout, (A. F. Wilson).

Probably a variety of *B. roseus*, growing in a warmer climate, as Tuckerman suggests. When not well developed it approaches the previous species.

5. *B. heteromorphus*, Nyl.

Thallus pallido glaucescent or pallido cinerascens, verrucoso unequal, forming large patches. Apothecia pale carneous, or carneo fuscenscent, $\cdot 5$ to 1 mm. broad, margin thick, undulate, obtuse, stipe 1 to 2.5 mm. high, variously compressed or plicate, often two to six or more apothecia on one stipe. Spores very transparent, nearly indistinct, ellipsoid, simple, $\cdot 01 \times \cdot 006$ mm. Thall. and Apoth. K. + C—.

Hab. on clay ground, mosses, dead leaves, &c., in mountain regions, Black Spur, Mt. Macedon, Warburton, Otway Ranges, Lilydale, Mt. Buffalo (A. F. Wilson).

6. *B. squamarioides*, Nyl. = *Knightiella leucocarpa* =
K. squamarioides, Mull. Arg.

Thallus albo or albido glaucescent, subopaque, squamose, squamæ difformis, about $\cdot 5$ mm. broad, affixed (forming small patches about an inch wide), lobate or lobato incised, plane or somewhat depressed in the centre, concolorous beneath or whiter. Apothecia lurid or pale lurid or lurido carneus, $\cdot 2$ to $\cdot 3$ mm. broad, biatorine, plane, margin thickish, evanescent. Spores oblong or fusiformi oblong, uniseptate.

Hab. on earth, Mt. William (D. Sullivan). Mull. Lich. Beitr., 1888, No. 13, p. 8.

7. *B. Frenchianus*, Mull. Arg.

Thallus squamose; squamæ caespitose, crowded, broad, inciso lobate; lobes ascending, crenulate or entire, olivaceous above, white beneath, bearing podetia here and there upon

their margins. Podetia about 2 mm. high, .66 mm. thick, olivaceous, thallino-corticate and sub-granuloso asperulate, or often towards the apex decorticate and somewhat rose-coloured, monocephalous. Apothecia about equally broad with the podetia; the whole of the apothecium at first rosello fuscous and very widely truncato obconical and plane, but soon fuscous and convex. Spores not fully evolved. Prof. J. Mueller in Ratisbon Flora.

GENUS 3.—THYSANOTHECIUM, Berk. and Mont.

Thallus partly horizontal, granulose or squamose, and partly podetiiform, often expanding at the apex, variously divided. Apothecia thin, pale or rufous, darker or lighter, terminating the terete podetium or covering the upper surface of the frond-like podetium. Spores small, ellipsoid, simple.

1. *T. hyalinum*, Taylor.

Thallus pale yellow or pale lurid, lobato granulose or squamose; podetia various in size (1 to 12 mm. high, .5 to 2 mm. thick), sulcato rugose, sometimes squamulose below; apex dilated on one side (1 to 10 mm. broad). Apothecia pallid or carneo-rufescent, or fusco rufus, forming a thin stratum on the upper surface of the apex. Spores 8 in the thecae, ellipsoid, simple, .006 to .008 \times .0035 (Nyl.)

Hab. on earth or decayed and generally burnt wood, common; Kew, Box Hill, Youyangs, Cobden, Mordialloc, Cheltenham, Oakleigh, Ringwood, Lilydale, Maffra.

Form *squamulosum*, Wilson.—Thallus yellow, more or less sordid or lurid, squamulose, squamules thick, either depressed and lobate, or somewhat ascending podetiiform, swollen upwards and briefly ramose. Apothecia cephaloid, sessile on the squamules and podetia, minute, crowded, not fully evolved.

Hab. on poor soil, Trentham (coll. by Mrs. Martin), Kew, Sandringham. Possibly a new species.

Form *intortum*, Wilson.—Thallus yellow, squamulose, podetia compressed and dilated, lobulate, apices crispate and intorted. Apothecia as in the typical form. Spores not fully evolved.

Hab. on decaying wood, Oakleigh. Coll. by Mrs. Martin.

2. *T. Hookeri*, Berk. et Mnt.

Thallus lurido flavescens, innato graniform, effuse. Podetia cinereo flavescens, about $\frac{1}{2}$ inch high, frondose, stipitate, firm, striato nervose, stipe subterete, about 6 mm. high, dilated above into a simple or lobed frond. Apothecia thinly but equally covering the one side of the frond, rufus or carneo-rufus or testaceo carneous, immarginate. Spores 8, ellipsoid, $\cdot 006$ to $\cdot 007 \times \cdot 0025$ to $\cdot 003$ mm.

Hab. on earth, near sea, Cheltenham.